UNITED STATES PATENT APPLICATION

for

POND SKIMMER APPARATUS

by

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POND SKIMMER APPARATUS

RELATED APPLICATION

[0001] This application claims the benefit of U.S. Provisional Patent Application serial number 60/440,155 filed on January 15, 2003.

FIELD OF THE INVENTION

[0002] The present invention relates to the general subject matter of maintaining artificial aquatic systems and, more particularly, to methods and apparatus for skimming and filtering or purifying the water in an aquatic life support system such as an ornamental pond.

BACKGROUND OF THE INVENTION

[0003] Ornamental pools, ponds, and similar water-filled structures are familiar fixtures in many homes and businesses. These bodies of water provide a pleasant environment for the occupants of the adjacent structure and, in some cases, create habitats for birds, small mammals, and various reptiles and amphibians. However, because these bodies of water are closed systems, some mechanism must be established to keep the water that is contained therein from becoming fouled and stagnant.

[0004] In a conventional arrangement, the water in the pond is continuously circulated through some combination of skimmers and filters, thereby reducing the level of particulate mater suspended within the water. Additionally, such water movement is usually designed to oxygenate the water, thereby making it possible for the pond to support aquatic life, such as fish, water plants, amphibians and such.

[0005] One filtering apparatus that is commonly used in connection with captive pools is a surface skimmer. As is well known to those of ordinary skill in the art,

skimmers are designed to draw surface water from the pond and into its interior where leaves and other floating debris are removed by filtration. The pond water is conventionally drawn into the interior of the skimmer by a submersible pump. Typically, the filtering function of the skimmer is performed by a basket, net, or other strainer which contains a coarse mesh which is designed to entrap the larger particles within the water that pass though it. The particles that have been entrapped within the strainer are then later removed by manually extracting the filtering element from the skimmer and emptying its contents into a waste receptacle.

[0006] It is well known to those of ordinary skill in the art that skimmers of the sort that are typically used in ornamental ponds are designed to be installed outside of the pond perimeter. In a conventional arrangement, an externally situated skimmer will be buried in the ground adjacent to the pond with the skimmer mouth at the same level as the normal water level. A pump is then conventionally placed inside of the skimmer body, the function of the pump is to pump water into the skimmer body interior where it can be filtered.

[0007] Of course, in a conventional skimmer, absent a continuous source of pond water the pump may empty the skimmer interior, thereby exhausting its source of fluid which can cause the pump to cavitate, which, in turn, can possibly damage the pump. In such a circumstance — and assuming that operating the pump in the absence of fluid has not damaged it to the point of inoperability — it may be necessary to prime the pump before it can be made operable again, which is, at minimum, an inconvenience.

[0008] The conventional arrangement, i.e., one where the skimmer is placed outside of the pool, can give rise to a variety of problems. For example, it is customary to

line artificial ponds with a thin plastic or rubber pond liner to separate the impounded water from the earth beneath, thereby improving water clarity and decreasing water loss through the contact with the ground. Of course, this liner must somehow be brought up to the mouth of the skimmer and sealed thereto. As is well known to those of ordinary skill in the art, this seal between the liner and the skimmer is subject to failure through poor installation, subsequent failure of the sealing adhesive due to exposure to sunlight or weather extremes, movement of the skimmer within its cavity in the ground, and many other possible factors As a consequence, water leaks through an imperfect seal between the skimmer and the pond liner are a frequent source of water loss and resultant aggravation to the owner.

[0009] In another common arrangement, a floating skimmer is utilized, wherein skimmer is largely free to float about the surface of the pond. In such an arrangement, the pump would typically be situated on the bottom of the pond and would be placed in fluid communication with the floating skimmer portion via some length of flexible plastic tubing. However, such arrangements have the disadvantage that the skimmer might be situated near the center of the pond when time comes to remove debris from it. Further, placement of the pump on the bottom of the pond makes it relatively inaccessible if a need for service arrives.

[0010] Heretofore, as is well known in the ornamental ponds arts, there has been a need for an invention to address and solve the above-described problems. Accordingly, it should now be recognized, as was recognized by the present inventor, that there exists, and has existed for some time, a very real need for a device that would address and solve the above-described problems.

[0011] Before proceeding to a description of the present invention, however, it should be noted and remembered that the description of the invention which follows, together with the accompanying drawings, should not be construed as limiting the invention to the examples (or preferred embodiments) shown and described. This is so because those skilled in the art to which the invention pertains will be able to devise other forms of this invention within the ambit of the appended claims.

SUMMARY OF THE INVENTION

[0012] There is provided hereinafter a new skimmer apparatus for use in ornamental ponds and the like. According to a first preferred embodiment there is provided a skimmer which is designed to sit within the pond itself, e.g., rest on a pond's plant shelf, or hang by straps or other mechanical means from the ponds edge. In a preferred arrangement, a submersible pump is attached directly to the exterior of the skimmer body to draw surface water into said skimmer for purposes of removing leaves and other debris from the water. In a first preferred variation, the submersible pump is mounted to a sidewall of skimmer at a point below the waterline. Such a configuration would be particularly suitable for plant shelf installations. In another variation, the pump is mounted directly to the bottom of skimmer for installation in ponds without plant shelves. The skimmer preferably contains a leaf strainer or basket for debris removal.

[0013] The foregoing has outlined in broad terms the more important features of the invention disclosed herein so that the detailed description that follows may be more clearly understood, and so that the contribution of the instant inventor to the art may be better appreciated. The instant invention is not to be limited in its application to the details of the construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. Rather, the invention is capable of other embodiments and of being practiced and carried out in various other ways not specifically enumerated herein. Further, the disclosure that follows is intended to apply to all alternatives, modifications and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims. Finally, it should be understood that the phraseology and terminology employed herein are for the purpose of description and

should not be regarded as limiting, unless the specification specifically so limits the invention.

[0014] While the instant invention will be described in connection with a preferred embodiment, it will be understood that it is not intended to limit the invention to that embodiment. On the contrary, it is intended to cover all alternatives, modifications and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Other objects and advantages of the invention will become apparent upon reading the following detailed description and upon reference to the drawings in which:

[0016] Figure **1** illustrates a preferred aspect of the instant invention, wherein the submersible pump is mounted to side of skimmer.

[0017] Figure **2** contains an illustration of another preferred aspect of the instant invention, wherein the submersible pump is mounted to bottom of skimmer.

[0018] Figure **3** illustrates in greater detail the embodiment of Figure **1**.

[0019] Figure **4** contains an illustration of preferred anchor for use in suspending the instant invention above the floor of a pool or pond.

[0020] Figure **5** illustrates a connector suitable for use in connecting a submersible pump to the instant skimmer invention.

[0021] Figure **6** contains an illustration of a plug for use with the instant invention.

[0022] Figure **7** illustrates a preferred embodiment of the instant invention as it might appear when installed on a plant step within a pond or pool.

DETAILED DESCRIPTION OF THE INVENTION

[0023] According to a preferred aspect of the instant invention, there is provided a water surface skimmer suitable for use, for example, within ornamental ponds and the like, wherein the skimmer is installed inside of the pond and wherein its pumping element is exterior to the skimmer body and directly attached thereto such that the pumping element is situated beneath the surface of the water.

GENERAL BACKGROUND

[0024] Most ponds are excavated in such a way that tiers or stair like shelves are created within them. This accomplishes several things, one being that the required pool depth can be reached without having to excavate the entire area to one specific depth, (i.e., less digging is required). This also creates ledges that are covered in water to varying water depths, such ledges being particularly suitable for the placement thereon of potted water plants, which might require varying depths of water in order to thrive depending on the plant species.

[0025] Residential water features are becoming increasingly popular with gardeners and homeowners and those of ordinary skill in the art will recognize that it is necessary to provide some sort of filtration to remove debris from the water, thereby enhancing the environment for aquatic life in the pond, such as fish, water plants, amphibians and the like. Without oxygenation and filtration, both mechanical and biological, ponds may become fouled or stagnant with well known consequences for the life resident therein.

[0026] One filtering apparatus that is commonly used in connection with captive pools is a surface skimmer. A surface skimmer is designed to draw surface water from the pond into its interior where leaves and floating debris are removed by passing the incoming surface water through a porous basket or a net, thereby capturing floating detritus for removal. In the ornamental pond industry it is customary to use a submersible pump which is positioned within the skimmer to draw water into the skimmer for filtering.

PREFERRED EMBODIMENTS

[0027] Turning first to Figure **1**, wherein a preferred embodiment **100** of the instant invention is illustrated, there is provided a skimmer which is designed to be situated within the confines of an ornamental pond. As can be noted from this illustration, in a first preferred arrangement the pumping element **150** is situated externally to the skimmer body **100** and is directly connected thereto. As will be made clearer in subsequent figures, the preferred pump **150** is of the submersible variety and will be directly mated to the skimmer body in such a way that during operation it is below the water level in the pond.

[0028] In a preferred arrangement, and as is discussed in greater detail hereinafter, the preferred skimmer **110** will have multiple openings **120** or ports (best seen in Figure **2**) to which a submersible pump **150** may be connected, preferably using ordinary mechanical fittings (e.g., via connector **130** best seen in Figure **5**). The location of the ports will be selected such that, upon attachment of a compatible pump **150**, water is drawn into the interior of the skimmer **110** through the skimmer aperture **140** and pulled downward through a leaf basket **160** or similar coarse straining device, by suction created by the pump **150** which is positioned below or lower than strainer basket **160** and skimmer window **140**. Additionally, optionally a filter medium **170** (e.g., a filter mat) could

optionally be included within the skimmer basket **160** to increase the amount of material that is removed from the water that is drawn therethrough. Note that in the preferred arrangement the strainer basket **160** (is designed to rest fully within the skimmer body **110** and be sized such that all of the water that enters the skimmer **110** must pass through it. As is well known to those of ordinary skill in the art, an objective of such baskets **160** is to trap larger particles that fall or are blown into the pond water, e.g., leaves, sticks, acorns, and other windblown debris, before these foreign items become saturated with water, lose buoyancy, and sink to the bottom of the pond where they become more difficult to remove. The holes in the skimmer basket **160** are typically of a size as to trap the larger particles while creating a minimum restriction of the flow of water through the skimmer system. The leaf basket **160** is conventionally designed for easy, unobstructed removal so that it can be frequently emptied and cleaned.

[0029] In the event that a side mounted pump **150** is utilized (e.g., Figure **1**), the skimmer **110** is preferably of such dimensions to permit it to be rested on a plant shelf or terrace within the ponds perimeter (e.g., as is illustrated in Figure **7**). Ports that are not currently in use will preferably be blocked (e.g., by using plug **610**, Figure **6**) to prevent subsurface water from entering skimmer via an open aperture **120**.

[0030] As is illustrated in Figure **2**, there are many different arrangements of the instant invention. In a first preferred configuration, the pumping element **150** of the instant invention is situated underneath the skimmer body **110** and connected directly thereto. Thus, when the skimmer **110** is installed inside of the pond, the pumping element will be effective and continue to draw water so long as there is sufficient water to reach the intake aperture of the skimmer. When attached in this fashion, the skimmer **110** may be

lowered into the water at the pond's perimeter and maintained at a constant water depth through the use of straps or other such materials as cables, pins, ropes or the like. In one preferred arrangement, pin **410** is inserted into the ground adjacent to the pond and one ore more straps affixed thereto. The other ends of the straps will be affixed to the skimmer **110** preferably along its upper periphery, e.g. at a protrusion provided for such a purpose proximate to its upper periphery (not shown in Figure **2**). In another arrangement, one end of the strap or straps will be looped about the upper periphery of the skimmer body **110** and the other secured to pin **410** or some other relatively immobile object. In Figure **1**, the rim that encircles the upper perimeter of skimmer **110** could serve to keep the skimmer from slipping through the restraining straps.

[0031] Thus, in this embodiment the skimmer **110** may be positioned in the water at any arbitrary depth, with the straps serving to hold it at the chosen depth as the pool water level falls and rises. Preferably, the skimmer **110** will be located at a depth that allows water to enter through the skimmer opening **140**. Additionally, the height above the bottom of the pond can be adjusted by varying the length of the straps, thereby controlling the level of water that enters the skimmer aperture **140**. This configuration is particularly suitable for use in ornamental ponds which do not have plant shelves. In addition to holding the skimmer **110** at a predetermined depth, the straps further act to prevent the skimmer **110** from floating out of position and into the middle of the pool through the force of wave and/or wind action and, if the skimmer **110** / pump **150** combination has negative buoyancy, the straps also keep it from sinking to the bottom of the pond.

[0032] As has been discussed previously, unused ports within the skimmer **110** are preferably closed prior to operating it within a pond. It should be clear that when the

attached pump is operating water is drawn through the skimmer window by suction **140**,. Water that is pulled into the pump **150** is preferably discharged via discharge orifice **210** and piped through an external filter before returning that water to the pond body via a waterfall or some other ornamental feature.

[0033] As can best be seen in Figure **2**, in a preferred arrangement the submersible pumping element **150** is attached to the base of the skimmer body using a threaded connection. As should be clear, a variety of pumps of different capacity may be connected to the exterior of skimmer body **110** via the preferred threaded fittings illustrated in this figure, but those skilled in the art to which this invention pertains, will be able to devise other methods of affixing such pumps to skimmer boxes, preferably with clamps, twist/lock devices, cam lever locks, or any other such connect/disconnect system

[0034] In Figure **3**, a preferred embodiment is illustrated wherein the pumping element **150** is attached directly to the side of the skimmer body. Once again, preferably, the connection will be via an internally threaded connector which is used in conjunction with connecting element **130**. The preferred internal threading within the wall of the skimmer **110** that facilitates the use of connector **130** is best seen in Figure **1**.

[0035] As is best illustrated in Figure **7**, a preferred method of installing one embodiment of the instant invention within the confines of an ornamental pond is to rest it on a step, plant shelf, or other shallow support surface within the pond body. Supplying the pumping apparatus **150** with electrical power will cause it to begin moving water through the skimmer **110**, thereby causing leaves and other surface debris to be sucked into the skimmer **110** where they will be trapped within the basket **160** for easy removal.

[0036] Figure **7** illustrates in greater detail a typical placement of a preferred embodiment of the instant invention during its installation. As should be clear from this figure, the skimmer **110** should be supported at a level within the pond such that the water surface falls within the limits of the skimmer window **140**. Also apparent in this figure is the discharge orifice **210** to which is typically connected tubing so that water may be conducted away from the skimmer **110** so that it can be further filtered, or returned to the pond in the form of waterfall or fountain. Note that the negative buoyancy of the unit **110** tends to keep it in place during operation but that preferably the unit will be additionally anchored via a mechanical anchoring system similar to that illustrated and discussed previously and hereafter.

CONCLUSIONS

[0037] There has been provided herein a new system for skimming debris and leaves from the surface of ornamental ponds which utilizes a submersible pump that is directly attached to a skimmer body. Note that the instant inventor has specifically contemplated many variations of the particular embodiments discussed herein. For example, note that the term "leaf basket" or "strainer" should be interpreted in its broadest sense to include rigid plastic, as well as woven nets suspended on wire frames, wire baskets, or any other arrangement which provides, at minimum, coarse filtering of the larger pond water debris.

[0038] Additionally, note that although the preferred skimmer body of the instant invention has been generally illustrated herein as having a box-like shape, it could in fact be provided in any number of alternative shapes to accommodate, for example, different shapes of baskets, nets, and the like. For example, the skimmer body could be rounded,

conical, low profile, or any number of other geometric shapes. The skimmer box itself could be made of any number of different materials including, without limitation, materials such as plastic, metal, composite material, foam, wood, or others.

[0039] Thus, it is apparent that there has been provided, in accordance with the invention, a patient sensor and method of operation of the sensor that fully satisfies the objects, aims and advantages set forth above. While the invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art and in light of the foregoing description. Accordingly, it is intended to embrace all such alternatives, modifications and variations as fall within the spirit of the appended claims.